ABSTRACT

In an epitaxial substrate (20) comprising a collector layer (22), a base layer (23) and an emitter layer (24) formed on a semi-insulating GaAs substrate (21), a hole barrier layer (22C) is provided in the collector layer (22) to prevent influx of holes from the base layer (23), whereby the flow of collector current is suppressed when the collector current density rises and electron velocity is saturated, suppressing thermal runaway of the collector current without a ballast resistance or the like. Also, thermal runaway of the collector current is suppressed by providing an additional layer (2C) for generating, in the conduction band, an electron barrier by means of electrons accumulated in the collector layer (2) when the collector current density rises.